

## CLAIMS

What is claimed is:

1. An intelligent device for coupling an electronic device to a network

5 comprising:

a first interface for communicatively coupling said intelligent device to said network, said network having a head end;

a second interface for communicatively coupling said intelligent device to a plurality of client devices such that said client devices are communicatively coupled to said network;

means for processing and interpreting data coupled to said first interface; and

fault detection means coupled to said means for processing and interpreting data, said fault detection means for performing fault detection in said network.

15 2. An intelligent device as recited in Claim 1 wherein said head end is a central control site operable to remotely access said means for processing and interpreting data.

3. An intelligent device as recited in Claim 1 wherein said fault detection means is configured to isolate faults in both an uplink from said head end of said network and a downlink from said head end of said network.

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4. An intelligent device as recited in Claim 1 wherein said fault detection means is selected from the group consisting essentially of: a link beat signal fault detection, a ping signal fault detection, and a loop-back mode for fault detection.

5 5. An intelligent device as recited in Claim 1 wherein said intelligent device is configured such that said intelligent device is provided power over said network.

6. An intelligent device as recited in Claim 5 wherein said head end is configured to activate and deactivate said intelligent device over said network.

7. An intelligent device as recited in Claim 5 wherein said intelligent device is configured to activate and deactivate said client devices.

8. An intelligent device as recited in Claim 1 wherein said intelligent device employs time domain reflectometry measurement techniques such that said fault detection means is operable to determine a distance from said intelligent device to said fault.

9. An intelligent device as recited in Claim 1 wherein said intelligent device is configured to receive data packets from said head end.

10. An intelligent device as recited in Claim 9 wherein said data packets are for operating diagnostic tests at said intelligent device for validating network connections.

11. An intelligent device for coupling an electronic device to a network

5 comprising:

a first interface for communicatively coupling said intelligent device to said network, said network having a head end;

a second interface for communicatively coupling said intelligent device to a plurality of client devices such that said client devices are communicatively coupled to said network;

a robust processor coupled to said first interface; and

a fault detector coupled to said robust processor.

12. An intelligent device as recited in Claim 11 wherein said head end is a

15 central control site operable to remotely access said robust processor.

13. An intelligent device as recited in Claim 11 wherein said fault detector is configured to isolate faults in both an uplink from said head end of said network and a downlink from said head end of said network.

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14. An intelligent device as recited in Claim 11 wherein said fault detector is selected from the group consisting essentially of: a link beat signal fault detector, a ping signal fault detector, and a loop-back mode for fault detection.

5 15. An intelligent device as recited in Claim 11 wherein said intelligent device is configured such that said intelligent device is provided power over said network.

16. An intelligent device as recited in Claim 15 wherein said head end is configured to activate and deactivate said intelligent device over said network.

10 17. An intelligent device as recited in Claim 15 wherein said intelligent device is configured to activate and deactivate said client devices.

18. An intelligent device as recited in Claim 11 wherein said intelligent device  
15 employs time domain reflectometry measurement techniques such that said fault detection means is operable to determine a distance from said intelligent device to said fault.

19. An intelligent device as recited in Claim 11 wherein said intelligent device  
20 is configured to receive data packets from said head end.

20. An intelligent device as recited in Claim 19 wherein said data packets are for operating diagnostic tests at said intelligent device for validating network connections.

21. A method for fault detection in a network, said method comprising the  
5 steps of:

a) providing an intelligent device coupled to a network, said intelligent device comprising a first interface for communicatively coupling said intelligent device to said network, a second interface for communicatively coupling said intelligent device to a plurality of client devices, a robust processor coupled to said first interface, and a fault  
10 detector coupled to said robust processor, said network having a head end;

b) monitoring said network for a fault by said intelligent device and said head end, such that said intelligent device and said head end operate in conjunction.

22. A method as recited in Claim 21 wherein said head end is a central control  
15 site operable to remotely access said robust processor.

23. A method as recited in Claim 21 wherein said fault detector is configured to isolate faults in both an uplink from said head end of said network and a downlink from said head end of said network.

24. A method as recited in Claim 21 wherein said fault detector is selected from the group consisting essentially of: a link beat signal fault detector, a ping signal fault detector, and a loop-back mode for fault detection.

5 25. A method as recited in Claim 21 wherein said intelligent device is configured such that said intelligent device is provided power over said network.

26. A method as recited in Claim 25 wherein said head end is configured to activate and deactivate said intelligent device over said network.

10 27. A method as recited in Claim 25 wherein said intelligent device is configured to activate and deactivate said client devices.

15 28. A method as recited in Claim 21 wherein said intelligent device employs time domain reflectometry measurement techniques such that said fault detection means is operable to determine a distance from said intelligent device to said fault.

29. A method as recited in Claim 21 wherein said intelligent device is configured to receive data packets from said head end.

20 30. A method as recited in Claim 29 wherein said data packets are for operating diagnostic tests at said intelligent device for validating network connections.